What is claimed is:

1. A color illuminating system comprising:

a light source that generates and emits white light;

a spiral lens disc that periodically scrolls light by rotational movement and has a spiral cylindrical lens array, which includes a plurality of cylindrical lenses, on at least one surface; and

an optical unit that separates light beams of different wavelengths from the white light emitted from the light source and guides the light beams to enter at least two effective regions of the spiral lens disc.

2. The color illuminating system of claim 1, wherein the optical unit further comprises:

a color filter that separates the light beams of different wavelengths from the white light received from the light source and make the light beams travel in a predetermined direction; and

a beam splitter that splits the light beams from the color filter to enter the at least two effective regions of the spiral lens disc.

3. The color illuminating system of claim 2, wherein the color filter further comprises;

a first dichroic prism that has a first mirror surface that is inclined at an angle to the optical axis of the incident light, reflects a first color light beam in the incident white light, and transmits light other than the first color light beam;

a second dichroic prism that is disposed next to the first dichroic prism and has a second mirror surface that is inclined at an angle to the optical axis of the

incident light, reflects a second color light beam in the light transmitted through the first dichroic prism, and transmits light other than the second color light; and

a third dichroic prism that is disposed next to the second dichroic prism and has a third mirror surface that is inclined at an angle to the optical axis of the incident light and reflects a third color light beam in the light transmitted through the second dichroic prism,

wherein the first, second, and third mirror surfaces of the first, second, and third dichroic prisms, which are located inside the color filter, allow light that enters at an angle satisfying the conditions of internal total reflection to be totally reflected, minimizing loss of the first, second, and third color light beams.

4. The color illuminating system of claim 3, further comprising;

a first polarizing beam splitter that is formed on an entrance surface of the first dichroic prism and transmits a first polarization component in the incident non-polarized white light toward the first dichroic prism and reflects a second polarized light;

a second polarizing beam splitter that reflects the second polarized light reflected by the first polarizing beam splitter toward the first dichroic prism; and

a half-wave plate that is arranged between the first dichroic prism and one of the first and second polarizing beam splitters to alter the phase of one of the first and second polarized light such that the first and second polarized light are in-phase.

5. The color illuminating system of claim 3, further comprising a first collimating lens in an optical path between the light source and the color filter, the first collimating lens converting and transmitting the incident non-polarized white light.

6. The color illuminating system of claim 3, further comprising first, second, and third relay lenses that are arranged opposite to the exit surfaces of the first, second, and third dichroic prisms, respectively, and diverge the first, second, and third color light beams, respectively, at a predetermined angle.

7. The color illuminating system of claim 6, further comprising a second collimating lens that is arranged in an optical path between the color filter and the beam splitter and which converges the first, second, and third color light beams from the color filter.

8. The color illuminating system of claim 6, further comprising a plurality of cylindrical lenses that are arranged in an optical path between the beam splitter and the spiral lens disc and in an optical path to receive light from the spiral lens disc and shape the first, second, and third color light beams received at different angles from the beam splitter.

9. The color illuminating system of claim 2, further comprising a second collimating lens that is arranged in an optical path between the color filter and the beam splitter and which converges first, second, and third color light beams from the color filter.

10. The color illuminating system of claim 2, wherein the beam splitter comprises:

an entrance surface that has an arrow-shaped cross-section and which

refracts incident first, second, and third color light beams outward away from the optical axis such that at least two split light beams are directed toward the spiral lens disc; and

an exit surface that is parallel to the entrance surface and which refracts the at least two split light beams to be closer to the optical axis and parallel to the first, second, and third light beams incident on the entrance surface.

11. The color illuminating system of claim 2, further comprising a plurality of cylindrical lenses that are arranged in an optical path between the beam splitter and the spiral lens disc and in an optical path to receive light from the spiral lens disc and which shape split light beams from the beam splitter.

12. The color illuminating system of claim 1, wherein the spiral lens disc comprises:

a first spiral lens disc that scrolls incident light; and

a second spiral lens disc that is spaced a predetermined distance from the first spiral lens disc and which corrects the angle of divergence of at least two light beams from the first spiral lens disc.

13. The color illuminating system of claim 12, further comprising a glass rod that is disposed in an optical path between the first and second spiral lens discs and which controls the angle of divergence of the at least two light beams from the first spiral lens disc.

14. The color illuminating system of claim 1, further comprising a fly-eye

lens array that is arranged in an optical path to receive the at least two light beams from the spiral lens disc and which forms bands of light of different colors in separate regions from the at least two scrolling light beams from the spiral lens disc.

15. The color illuminating system of claim 14, wherein the fly-eye lens array comprises:

a plurality of first fly-eye lenses that are arranged in the optical paths of the at least two light beams from the beam splitter, respectively, and have a two-dimensional array of protrusions on an entrance surface and/or an exit surface; and

a plurality of second fly-eye lenses that are arranged next to the plurality of first fly-eye lenses and which have a two-dimensional array of protrusions on an entrance surface or an exit surface.

16. The color illuminating system of claim 14, further comprising a fourth relay lens that is arranged in the optical path of light beams from the fly-eye lens array and which focuses the bands of light of different colors from the fly-eye lens in predetermined positions.

17. A projection type image display apparatus comprising:

a light source that generates and emits white light;

a spiral lens disc that periodically scrolls light by rotational movement and which has a spiral cylindrical lens array, which includes a plurality of cylindrical lenses, on at least one surface;

an optical unit that separates light beams of different wavelengths from the white light emitted from the light source and guides the light beams to enter at least

two effective regions of the spiral lens disc;

an image forming unit that forms images using the light from the spiral lens disc; and

a projection lens unit that enlarges and projects the images formed by the image forming unit on a screen.

18. The projection type image display apparatus of claim 17, wherein the optical unit comprises:

a color filter that separates the light beams of different wavelengths from the white light received from the light source and make the light beams travel in a predetermined direction; and

a beam splitter that splits the light beams from the color filter to enter the at least two effective regions of the spiral lens disc.

19. The projection type image display apparatus of claim 18, wherein the color filter comprises;

a first dichroic prism that has a first mirror surface that is inclined at an angle to the optical axis of the incident light, reflects a first color light beam in the incident white light, and transmits light other than the first color light beam;

a second dichroic prism that is disposed next to the first dichroic prism and has a second mirror surface that is inclined at an angle to the optical axis of the incident light, reflects a second color light beam in the light transmitted through the first dichroic prism, and transmits light other than the second color light beam; and

a third dichroic prism that is disposed next to the second dichroic prism and has a third mirror surface that is inclined at an angle to the optical axis of the incident

light and reflects a third color light beam in the light transmitted through the second dichroic prism,

wherein the first, second, and third mirror surfaces of the first, second, and third dichroic prisms, which are located inside the color filter, allow light that enters at an angle satisfying the conditions of internal total reflection to be totally reflected, minimizing loss of the first, second, and third color light beams.

20. The projection type image display apparatus of claim 19, further comprising;

a first polarizing beam splitter that is formed on an entrance surface of the first dichroic prism and which transmits first polarization component in the incident non-polarized white light toward the first dichroic prism and reflects second polarized light;

a second polarizing beam splitter that reflects the second polarized light reflected by the first polarizing beam splitter toward the first dichroic prism; and

a half-wave plate that is arranged between the first dichroic prism and one of the first and second polarizing beam splitters to alter the phase of one of the first and second polarized light such that the phases of the first and second polarized light are equal.

21. The projection type image display apparatus of claim 19, further comprising a first collimating lens in an optical path between the light source and the color filter, the first collimating lens converting and transmitting the incident non-polarized white light.

22. The projection type image display apparatus of claim 19, further comprising first, second, and third relay lenses that are arranged opposite to the exit surfaces of the first, second, and third dichroic prisms, respectively, and which diverge the first, second, and third color light beams, respectively, at a predetermined angle.

23. The projection type image display apparatus of claim 22, further comprising a second collimating lens that is arranged in an optical path between the color filter and the beam splitter and which converges the first, second, and third color light beams from the color filter.

24. The projection type image display apparatus of claim 22, further comprising a plurality of cylindrical lenses that are arranged in an optical path between the beam splitter and the spiral lens disc and in an optical path to receive light from the spiral lens disc and shape the first, second, and third color light beams received at different angles from the beam splitter.

25. The projection type image display apparatus of claim 18, further comprising a second collimating lens that is arranged in an optical path between the color filter and the beam splitter and which converges first, second, and third color light beams from the color filter.

26. The projection type image display apparatus of claim 18, wherein the beam splitter comprises:

an entrance surface that has an arrow-shaped cross-section and which

refracts incident first, second, and third color light beams outward away from the optical axis such that at least two split light beams go toward the spiral lens disc; and

an exit surface that is parallel to the entrance surface and refracts the at least two split light beams to be closer to the optical axis and parallel to the first, second, and third light beams incident on the entrance surface.

27. The projection type image display apparatus of claim 18, further comprising a plurality of cylindrical lenses that are arranged in an optical path between the beam splitter and the spiral lens disc and in an optical path to receive light from the spiral lens disc and shape split light beams from the beam splitter.

28. The projection type image display apparatus of claim 17, wherein the spiral lens disc comprises:

a first spiral lens disc that scrolls incident light; and

a second spiral lens disc that is spaced a predetermined distance from the first spiral lens disc and which corrects the angle of divergence of at least two light beams from the first spiral lens disc.

29. The projection type image display apparatus of claim 28, further comprising a glass rod that is disposed in an optical path between the first and second spiral lens discs and which controls the angle of divergence of the at least two light beams from the first spiral lens disc.

30. The projection type image display apparatus of claim 17, further comprising a fly-eye lens array that is arranged in an optical path to receive the at

least two light beams from the spiral lens disc and which forms bands of light of different colors in separate regions from the at least two scrolling light beams from the spiral lens disc.

31. The projection type image display apparatus of claim 30, wherein the fly-eye lens array comprises:

a plurality of first fly-eye lenses that are arranged in the optical paths of the at least two light beams from the beam splitter, respectively, and which have a two-dimensional array of protrusions on an entrance surface or an exit surface; and

a plurality of second fly-eye lenses that are arranged next to the plurality of first fly-eye lenses and which have a two-dimensional array of protrusions on an entrance surface or an exit surface.

32. The projection type image display apparatus of claim 17, wherein the optical unit further comprises an integrated optical element that alters the direction in which light from one of the first and second effective regions of the spiral lens disc scrolls such that light beams from the first and second effective regions scroll in the same direction and that combines the light beams from the first and second effective regions.

33. The projection type image display apparatus of claim 32, wherein the integrated optical element comprises:

a scroll direction altering prism that is arranged in the optical path of the light beam from one of the first and second effective regions of the spiral lens disc and alters the direction in which the light beam from one of the first and second effective

regions scrolls such that the light beams from the first and second effective regions scroll in the same direction; and

a beam shifter that is arranged in the optical path of the light beam from one of the first and second effective regions of the spiral lens disc and which shifts the light beam from one of the first and second effective regions toward the light beam from the other effective region to combine the light beams from the first and second effective regions.

34. The projection type image display apparatus of claim 33, wherein the scroll direction altering prism is an Amichi prism that alters the scroll direction by reversing light from one of the first and second effective regions of the spiral lens disc.

35. The projection type image display apparatus of claim 33, wherein the beam shifter shifts the incident light beam by refracting and transmitting the incident light based on a difference in refractive index and which comprises an entrance surface that is inclined at an angle to the optical axis of the incident light beam and an exit surface that is arranged parallel to and separated a predetermined distance from the entrance surface.

36. The projection type image display apparatus of claim 33, wherein the beam shifter shifts the incident light beam by totally reflecting the incident light beam and which comprises first and second reflection planes that are inclined at an angle to the optical axis of the incident light beam.

37. The projection type image display apparatus of claim 32, wherein the integrated optical element comprises:

a polarizing plate that is arranged in an optical path in front of one of the first and second effective regions of the spiral lens disc and which alters the polarization of incident light such that the light beams transmitted through the first and second effective regions have different polarization components;

a scroll direction altering prism that is arranged in the optical path of the light beam from one of the first and second effective regions of the spiral lens disc and which alters the direction in which the light beam from one of the first and second effective regions scrolls such that the light beams from the first and second effective regions scroll in the same direction; and

a third polarizing beam splitter that is formed on one surface of the scroll direction altering prism and which selectively transmits or reflects incident light according to the polarization of the incident light to make the light beams transmitted through the first and second effective regions travel toward the image forming unit along the same optical path.

38. The projection type image display apparatus of claim 37, further comprising a plurality of fourth relay lenses that are arranged in the optical paths of the light beams from the first and second effective regions of the spiral lens disc, respectively, and which guide scroll first, second, and third color light beams from the spiral lens disc to enter the image forming unit along the same optical path.

39. The projection type image display apparatus of claim 17, wherein the image forming unit comprises:

a reflection type liquid crystal display that forms images by modulating the scrolling light from the spiral lens disc; and

a beam splitter that is arranged in front of the reflection type liquid crystal display and which alters the optical path of incident light such that light from the optical unit goes toward the reflection type liquid crystal display and light from the reflection type liquid crystal display is directed toward the projection lens unit.

40. The projection type image display apparatus of claim 17, wherein the image forming unit is a micro-mirror device that generates the images by modulating the scrolling light from the spiral lens disc and which reflects the generated images in a predetermined direction.